

Overview of Products Present at Nail Salons, Chemicals in Products, and Potential Exposures and Health Effects

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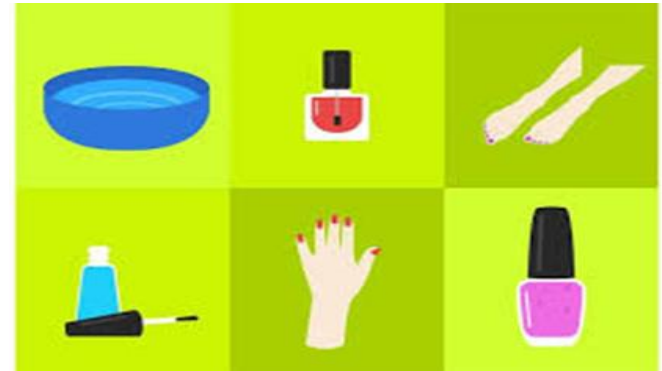
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Overview

- Statement of the chemical exposure / health related issues in nail salons
- Overview of chemicals used in nail salons
- Discuss the potential routes for exposures in nail salons
- Present potential health effects from exposure to chemicals



Statement of the Issues

- A wide variety of chemicals are found in nail salon products
- It is difficult to establish definitive list of products
- Many are volatile organic chemicals that readily evaporate and could be present in indoor air of nail salons
- Studies of health outcomes in nail salon workers show associations with respiratory, musculoskeletal, and neuropsychological symptoms
- Other reported health effects include irritation of eyes, nose, throat, and skin, and headaches
- No studies found regarding reproductive outcomes among nail salon workers



Chemicals Used in Nail Salons - Difficulty in Establishing Definitive List

- Approximately 100 chemicals potentially found in nail salon products (New Ecology Inc., 2006)
- A single nail polish can contain dozens of chemical constituents (Toxnet Household Product Database, 2015)
- Difficult to establish a list of ingredients
 - Ingredients vary between products
 - Influenced by characteristics as polish color, texture, drying time, etc.
 - Ingredients common now or in the past may not be used in the future
 - Chemicals not currently in use may become common in the future



Most Common Categories of Products Currently Reported in Nail Salons

- Solvents, thinners, glues, nail polish removers
- Nail polishes
- Nail hardeners, artificial nails
- Disinfectants



Potential Routes of Exposure to Workers and Customers

- Inhalation – breathing of chemicals that volatilize from products
 - Inhalation of volatile chemicals during product removal and product application
 - Inhalation of particulates during removal and application of acrylic products



Potential Routes of Exposure to Workers and Customers

- Dermal Contact – contact with chemicals (workers) and application of products (customers)
 - Contact with removers, polishes, gels, acrylics, glues
 - UV light from gel setting equipment



Potential Routes of Exposure to Workers and Customers

- Incidental ingestion
 - Hand to mouth contact
 - Accidental splashing



Solvents, Thinners, Glues, Nail Polish Remover

Chemical	Short Term Effect	Long Term Effect
Acetone	Headache, dizziness, nausea, irritation	Kidneys, blood, liver, CNS
Acetonitrile	Irritation, nausea, vomiting, weakness, exhaustion	CNS
Butyl acetate	Headache, dizziness, confusion, drowsiness, irritation	Irritation of eyes, skin
Ethyl acetate	Irritation, GI effects, confusion	Dermatitis
Ethyl cyanoacrylate	Irritation	Skin sensitization
Isopropyl acetate	Irritation, sleepiness, burning of skin and eyes	Dermatitis

Solvents, Thinners, Glues, Nail Polish Remover (cont)

Chemical	Short Term Effect	Long Term Effect
Methanol	Irritation, nausea, confusion, headache, dizziness, blurred vision, incoordination	Developmental, ocular, dermatitis, CNS
Methyl ethyl ketone	Irritation, headache, dizziness, drowsiness, vomiting	Developmental, dermatitis
toluene	Headache, confusion, dizziness, numbness, muscle fatigue, irritation	CNS, liver, kidneys, development, dermatitis

Nail Polishes

Chemical	Short Term Effect	Long Term Effect
Benzene	Drowsiness, dizziness, increased heart rate, headache, tremors, confusion	Increase risk of cancer, effects on blood, immune and CNS
Dibutyl phthalate	irritation	Reproductive and development effects, liver, kidney
Di(2-ethylhexyl)phthalate	irritation	Reproductive and developmental effects, cancer
Butyl acetate	Headache, dizziness, confusion, drowsiness, irritation	Irritation of eyes, skin

Nail Polishes (cont)

Chemical	Short Term Effect	Long Term Effect
Ethyl acetate	Irritation, GI irritation, confusion	Dermatitis
Formaldehyde	Difficulty breathing, coughing, allergic reactions, irritation	Cancer, respiratory system, contact dermatitis
Isopropyl acetate	Irritation, sleepiness, burning of skin and eyes	Dermatitis
toluene	Headache, confusion, dizziness, numbness, muscle fatigue, irritation	CNS, liver, kidneys, development, dermatitis

Nail Hardeners, Artificial Nails

Chemical		
Tosylamide formaldehyde resin	Irritation	Skin sensitization
Benzoyl peroxide	Irritation	Skin sensitization
Butyl methacrylate	Irritation, loss of appetite, inability to sleep and concentration, depression	Skin sensitization
Dimethyl p-toluidine	Methemoglobinemia and associated symptoms	Liver, kidney, respiratory, digestive, spleen, cancer
Ethylene dimethylacrylate	Irritation	Skin sensitization
Ethyl methacrylate	Irritation, difficulty breathing, dizziness	Skin sensitization

Nail Hardeners, Artificial Nails (cont)

Chemical		
2-hydroxyethyl acrylate	irritation	Skin sensitization
2-hydroxyethyl methacrylate	Dizziness, irritation	Skin sensitization
2-hydropropyl acrylate	Irritation, eye and skin burns, cough, dyspnea	Skin sensitization
Hydroquinone	Irritation and inflammation of eyes, skin irritation, nausea, dizziness, rapid breathing, muscle contraction, CNS excitement	Skin sensitization, dermatitis
Isobutyl methacrylate	irritation	Skin sensitization
Methacrylic acid	Skin burns, irritation, difficulty breathing	Respiratory system

Nail Hardeners, Artificial Nails (cont)

Chemical		
Methylene chloride	Irritation, lowering of consciousness, methemoglobinemia	CNS
Methyl methacrylate	Asthma, irritation, difficulty concentrating, loss of smell	Skin sensitization, respiratory effects
Phthalic anhydride	irritation	Skin and respiratory sensitization, irritation, asthma, bronchitis

Disinfectants

Chemical	Short Term Effect	Long Term Effect
Ortho-phenyl phenol	Irritation, abdominal cramps, pain	Cancer, kidneys
Quaternary ammonium compounds	Irritation, skin burns, nausea, vomiting, abdominal pain, asthma	Irritant contact dermatitis, skin sensitization

Summary of Common Effects

- Short Term:

- irritation of the eyes, nose, throat, skin, and respiratory tract
- reversible CNS symptoms such as headache, dizziness, drowsiness
- difficulty breathing
- methemoglobinemia

- Long Term:

- skin sensitization
- adverse effects on liver and kidney
- risk of certain cancers
- reproductive system effects
- effects on developing fetus

Final Comments



- Some types of chemicals found in nail salon products are associated with adverse health effects at certain exposure levels
- Nail salon workers and clients may be at risk for such adverse health effects
- To assess potential for adverse health effects, it is necessary to understand the dose to which worker / clients may be exposed
- Measures to decrease exposure (e.g., ventilation, gloves, alternative chemicals) will decrease potential for health risks

Thank you!

Questions?

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